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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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EXAMINER	
LARKIN, DANIEL SEAN	

ART UNIT	PAPER NUMBER
2856	

DATE MAILED: 05/03/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary	Application No.	Applicant(s)	
	10/675,846	DISCENZO, FREDERICK M.	
	Examiner	Art Unit	
	Daniel S. Larkin	2856	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *16 February 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-49* is/are pending in the application.

4a) Of the above claim(s) *9,10,13-16,19,20 and 25-49* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8,11,12 and 21-24* is/are rejected.

7)☐ Claim(s) *17 and 18* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *30 September 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *8/30/04 + 2/9/05*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicant's election of the species embodied in claims 8 and 17 and 18 in the reply filed on 16 February 2005 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

2. Claims 9, 10, 13-16, 19, 20, and 25-49 are withdrawn from further consideration pursuant to 37 CFR 1.142(b) as being drawn to a nonelected species, there being no allowable generic or linking claim. Election was made **without** traverse in the reply filed on 16 February 2005.

Drawings

3. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description:

Reference numeral -- 714 -- does not appear within Figure 7, as suggested by the specification on page 23, line 13.

Reference numeral -- 2100 -- does not appear within Figure 21, as suggested by the specification on page 31, line 16.

Reference numeral -- 136 -- does not appear within Figure 26, as suggested by the specification on page 35, line 6.

Reference numeral – 2615 -- does not appear within Figure 26, as suggested by the specification on page 37, line 28.

4. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference character(s) not mentioned in the description:

Reference numeral "284", as shown in Figure 7, does not appear within the written specification.

Reference numeral "2611", as shown in Figure 26, does not appear within the written specification.

5. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "limitation of claim 17 in combination with the teachings recited in claim 1" must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

6. Corrected drawing sheets in compliance with 37 CFR 1.121(d), or amendment to the specification to add the reference character(s) in the description in compliance with 37 CFR 1.121(b) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. If a drawing figure is to be canceled, the appropriate figure must be removed

from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

7. The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

8. The disclosure is objected to because of the following informalities:

Page 12, line 31: The term "with" should be deleted.

Page 14, line 11: The term "if" should be corrected with the term -- of --.

Page 23, line 7: The phrase "Fig.6" should be corrected to read -- Fig. 6 --.

Page 25, line 21: The phrase "F2on" should be corrected to read -- F2 on --.

Page 28, line 2: The numeral "1308" should be corrected to read -- 1306 --.

Page 30, line 23: The term "Alternative" should be corrected to read -- Alternatively --.

Page 33, line 12: The phrase "Fig 25" should be corrected to read -- Fig. 25 --.

Page 34, line 15: The term "in" should be deleted.

Page 37, line 28: The numeral "2615" should be corrected to read -- 2611 --. Appropriate correction is required.

9. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required:

The specification fails to provide antecedent basis for the term "data packet" as recited in claim 24.

Claim Objections

10. Claims 7 and 8 are objected to because of the following informalities:

Re claim 7, claim lines 2 and 3: The abbreviations "TCP", "ZDDP" and "TAN" should initially be spelled out.

Re claim 8, claim line 4: A -- period -- should be inserted after the term "measurements". Appropriate correction is required.

Claim Rejections - 35 USC § 102

11. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

12. Claims 1, 7, 12, 21, and 22 are rejected under 35 U.S.C. 102(a) as being anticipated by US 6,561,010 (Wilson et al.).

With respect to the limitations of claim 1, the reference to Wilson et al. discloses a method and apparatus for analyzing a fluid used in a machine, whereby the reference discloses that at least one meter or sensor is/are provided to gather information on a plurality of parameters of a fluid; and an evaluation of the lubricity of the fluid is determined from the measured parameters.

With respect to the limitations of claim 7, the reference to Wilson et al. discloses that the parameters measured include temperature (216), viscosity, total acid number, TCP, ZDDP, and oxidation.

With respect to the limitation of claim 12, the reference to Wilson et al. appears to disclose that the fluid analysis i evaluated in real-time. This would appear to suggest that constant measurements of the lubricating parameters are undertaken.

With respect to the limitation of claim 21, the reference discloses that the multi-element sensor (202, 216) is enclosed within a casing (200), which includes piping for

the lubricant flow. The casing (200) confines a sample of the fluid within the casing (200).

With respect to the limitation of claim 22, the reference discloses the use of a heater (204) to maintain the fluid at a particular temperature. The reference discloses the heating benefits over the cooling benefits of the fluid, col. 7, lines 45-48.

13. Claims 1, 2, and 7 are rejected under 35 U.S.C. 102(b) as being anticipated by US 5,817,928 (Garvey, III et al.).

With respect to the limitations of claim 1, the reference to Garvey, III et al. discloses a method and apparatus for lubrication fluid analysis, whereby the reference discloses that multiple sensors are provided to gather information on a plurality of parameters of a fluid; and an evaluation of the lubricity of the fluid is determined from the measured parameters.

With respect to the limitation of claim 2, the reference discloses that generating a spectrum plot based in part on the measured parameters is well known since the use of Fourier Transform Infrared Spectrometry is well known as a means to determine parameters that fall into a chemistry category, such as oxidation.

With respect to the limitations of claim 7, the reference to Garvey, III et al. discloses that measuring parameters, such as oxidation, density, viscosity, Total Acid Number, and conductivity are well known in the art.

14. Claims 1, 2, 6-8, 12, 21, and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by US 6,196,057 (Discenzo).

With respect to the limitations of claim 1, the reference to Discenzo ('057) discloses an integrated multi-element lubrication sensor for in situ monitoring of a lubrication fluid; and a data fusion processor that calculates lubricity of the fluid based on parameters measured by the multi-element sensor.

With respect to the limitation of claim 2, the reference to Discenzo ('057) discloses that the sensed lubricant parameters may be employed to generate Fourier Transform Infrared spectra, col. 16, lines 12-21.

With respect to the limitation of claim 6, the reference to Discenzo ('057) discloses that the data fusion processor is algorithmic processing of the sensor data, col. 13, lines 25-28. Additionally, the reference discloses, col. 15, lines 4-10, that sensor fusion is employed to combine information from two or more sensors in accordance with a "pre-established model or framework" so as to determine the state of the lubrication system using the combined sensed information.

With respect to the limitations of claim 7, the reference to Discenzo ('057) discloses that the measured parameters include pH, viscosity, temperature, and degree of oxidation.

With respect to the limitation of claim 8, the reference to Discenzo ('057) discloses that chemical sensors are utilized to determine chemical factors that affect lubricity and that the data fusion processor uses algorithmic processing on the sensor data, col. 13, lines 25-28. Additionally, the reference discloses, col. 15, lines 4-10, that

sensor fusion is employed to combine information from two or more sensors in accordance with a "pre-established model or framework" so as to determine the state of the lubrication system using the combined sensed information.

With respect to the limitation of claim 12, the reference to Discenzo ('057) discloses that the health of the lubrication system is evaluated in real-time. This would appear to suggest that constant measurements of the lubricating parameters are undertaken.

With respect to the limitation of claim 21, the reference to Discenzo ('057) discloses that the Figures 7a-7c and 7e all disclose the sensing device housed within a casing (400, 402, 406, 420), the casing confining the machine piece as well as the lubricant or fluid for the machine piece.

With respect to the limitation of claim 24, the reference to Discenzo ('057) discloses a data packet/fluid analyzer comprising a component/processor calculates lubricity.

15. Claims 1, 7, 8, 11, 12, 21, 23, and 24 are rejected under 35 U.S.C. 102(b) as being anticipated by US 6,324,899 (Discenzo).

With respect to the limitations of claim 1, the reference to Discenzo ('899) discloses an integrated multi-element lubrication sensor for in situ monitoring of a lubrication fluid used in bearings; and a data fusion processor that calculates lubricity of the fluid based on parameters measured by the multi-element sensor.

With respect to the limitations of claim 7, the reference to Discenzo ('899) discloses that the measured parameters include pH, viscosity, and temperature.

With respect to the limitation of claim 8, the reference to Discenzo ('899) discloses that chemical sensors are utilized to determine chemical factors that affect lubricity and that the data fusion processor uses algorithmic processing on the sensor data.

With respect to the limitation of claim 11, the reference to Discenzo ('899) discloses that a lubrication analysis system (68) controls the lubrication health of the bearing based on reading received fro one or more lubrication sensing devices (20). The reference further discloses that the system (68) could initiate automatic correction procedures based on the current lubrication health analysis.

With respect to the limitation of claim 12, the reference to Discenzo ('057) discloses that the health of the lubrication system is evaluated in real-time. This would appear to suggest that constant measurements of the lubricating parameters are undertaken.

With respect to the limitation of claim 21, the reference to Discenzo ('899) discloses that the Figures 4a, 4b, 5-9, and 15 all disclose the sensing device (20) housed within a casing, the casing confining the bearings as well as the lubricant or fluid for the bearings.

With respect to the limitation of claim 23, the reference to Discenzo ('899) discloses that a processor (130) of the system could be programmed to perform an

emergency shut-down of a motor (70) when lubrication conditions approach a critical level.

With respect to the limitation of claim 24, the reference to Discenzo ('899) discloses a data packet/fluid analyzer comprising a component/processor calculates lubricity.

Claim Rejections - 35 USC § 103

16. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

17. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,196,057 (Discenzo) in view of US 6,561,010 (Wilson et al.).

With respect to the limitation of claim 3, the reference to Discenzo ('057) discloses all of the limitations of base claims 1 and 2; however, the reference to Discenzo '057) fails to disclose means for varying the temperature of the fluid in proximity to the multi-element sensor. The reference to Wilson et al. discloses a method and apparatus for analyzing a fluid used in a machine, whereby the reference discloses that at least one meter or sensor is/are provided to gather information on a plurality of parameters of a fluid; and an evaluation of the lubricity of the fluid is determined from the measured parameters. Additionally, the reference to Wilson et al.

further discloses the use of a heater (204) to maintain the fluid at a particular temperature. Providing means for controlling the temperature of the fluid would have been obvious to one of ordinary skill in the art as a means of providing stable temperature, and thus greater measurement accuracy in evaluating the viscosity of the measuring fluid.

18. Claims 4 and 5 are rejected under 35 U.S.C. 103(a) as being unpatentable over US 6,196,057 (Discenzo) in view of US 6,324,899 (Discenzo).

With respect to the limitation of claim 4, the reference to Discenzo ('057) discloses all of the limitations of base claims 1 and 2; however, the reference to Discenzo ('057) fails to disclose a control component that maintains the fluid based on the calculated lubricity. The reference to Discenzo ('899) discloses bearing sensor integration for a lubrication analysis system. The reference to Discenzo ('899) further discloses a plurality of sensing devices located within a bearing casing. Additionally, the reference to Discenzo ('899) discloses that a lubrication analysis system (68) controls the lubrication health of the bearing based on reading received from one or more lubrication sensing devices (20). The reference further discloses that the system (68) could initiate automatic correction procedures based on the current lubrication health analysis, such as introducing additives to the lubricant. Providing means for automatically maintaining the fluid based on the measured parameters would have been obvious to one of ordinary skill in the art as a means of operating the machine for longer periods of time without requiring human intervention, which would require the machine

to be taken out of service, thus resulting in significant downtime of the machine and productivity.

With respect to the limitation of claim 5, the reference to Discenzo ('057) discloses all of the limitations of base claims 1 and 2; however, the reference to Discenzo ('057) fails to disclose a component that controls operation of a machine based in part on the calculated lubricity. The reference to Discenzo ('899) discloses bearing sensor integration for a lubrication analysis system. The reference to Discenzo ('899) discloses a plurality of sensors located within a bearing casing. The reference further discloses that a processor (130) of the system could be programmed to perform an emergency shut-down of a motor (70) when lubrication conditions sensed by the sensors (20) approach a critical level. Providing means for controlling the operation of a machine based upon a lubricity value would have been obvious to one of ordinary skill in the art as a means of preventing damage to the machine by eliminating or reducing its operation with lubricant which is not conditioned to perform its intended function.

Allowable Subject Matter

19. The following is a statement of reasons for the indication of allowable subject matter:

Prior art was not relied upon to reject claims 17 and 18 because the prior art fails to teach and/or make obvious a multi-element sensor positioned within a machine for in situ determination of a lubricity of a fluid, whereby the multi-element sensor is comprised of two surfaces that are provided with one or more forces, such that the

forces cause the two surfaces to generate a frictional force between the two surfaces; and a component that measures displacement relative to the two surfaces and the force causing the displacement in combination with all of the remaining limitations of the base claim.

Conclusion

20. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

The prior art to US 6,286,363 (Discenzo) provides a description of an integrated multi-element lubrication sensor similar in structure and function as the lubrication sensor disclosed in US 6,196,057 (Discenzo).

The prior art to US 5,964,318 (Boyle et al.) discloses a system for maintaining the quality and level of lubricant in an engine by using a controller in response to signals from a plurality of sensors (28) and a control algorithm determines when action is necessary to remove old lubricant from a reservoir and replace it with fresh lubricant.

The prior art to US 6,534,010 (Sentmanat) discloses an apparatus for process line testing comprising a rheometer in contained within a process flow comprising a rotating platen (14) in close relation to a platen (16) connected to a torque measuring device (18).

21. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Daniel S. Larkin whose telephone number is 571-272-2198. The examiner can normally be reached on 8:00 AM - 5:00 PM Mon-Fri.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Hezron Williams can be reached on 571-272-2208. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Daniel Larkin
AU 2856
29 April 2005

DANIEL S. LARKIN
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